

**Docket No.: 03-28 US**  
**Serial No. 10/664,617**

### **REMARKS**

This submission is in response to the Office Action, dated October 7, 2005, a response to which is due on January 7, 2006. Since this response is filed within the three-month shortened statutory period of time set for response, no extension of time is necessary. Favorable consideration is respectfully requested in view of the following Amendments and Remarks.

#### **I. RESTRICTION REQUIREMENT AND STATUS OF THE CLAIMS:**

Claims 31-38 have been pending. In the Office Action, the Examiner withdrew claims 1-30 and 39-46 from further consideration as being directed to a nonelected invention, and laid out the grounds for restriction of the claims as follows:

Group I, claims 1-16, directed to a halogenated polymer of vinyl aromatic monomers, classified in class 526, subclass 296;

Group II, claims 17-39, directed to a polymer bead (fluorocarbyl), classified in class 526, subclass 242;

Group III, claims 31-38, directed to a method to separate a mixture of analytes, classified in class 210, subclass 635; and

Group IV, claims 39-46, directed to a chromatographic method for separating labeled nucleic acids from unlabeled nucleic acids, classified in class 435, subclass 803.

In a telephone conversation with Bella Fishman conducted on November 15, 2004, a provisional election of the claims of Group III, claims 31-38, was made with traverse. Applicant hereby affirms this election, with traverse.

The restriction between Groups I and II and between III and IV is traversed. Restriction between Groups I and II is not proper. There would be no additional burden on the Examiner to perform the search necessary for examination of the claims of Groups I and II, and in fact, these two groups of claims belong to the same class. Both sets of claims in Groups I and II are drawn to compositions of halogenated polymers useful for separating analytes. The Examiner did not even cite reasons for why the inventions of the claims of Groups I and II are distinct. Therefore, the restriction is improper and should be withdrawn.

Restriction between Groups III and IV is not proper. The Examiner stated that "[i]nventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects", (citing MPEP §§ 806.04 and 808.01). Applicant points out that there is no evidence that the inventions of Groups III and IV are unrelated using these criteria. Both sets of claims are directed to methods for separating analytes, though the claims of Group IV are drawn to separating a narrower genus

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of analytes, specifically, labeled and unlabeled oligonucleotides. The fact that the claims have varying scope is not evidence of unrelatedness, and, to the contrary, is evidence that the claims are in fact related.

Applicant submits that the restriction between the claims of Groups I and II and between the claims of Groups III and IV is improper and respectfully requests that the restriction between these groups of claims be withdrawn. Accordingly, Applicant respectfully requests reinstatement and examination of claims 39-46. In the event the Examiner is not persuaded, Applicant hereby withdraws claims 1-30 and 39-46 from examination without prejudice, and expressly reserves his right under 35 U.S.C. § 121 to file a divisional application directed to the non-elected subject matter during the pendency of this application.

New claims 47-84 have been added in order to more particularly point out and distinctly claim additional aspects that Applicant regards as the invention. Support for the new claims is found, *inter alia*, in Applicant's specification on pages 18-30, and in the claims as filed. No new matter has been added.

Claims 32 and 37 have been amended to more particularly point out and distinctly claim that which Applicant regards as the invention. Support for the amendments can be found, *inter alia*, in the claims as filed, and page 3, line 18, and page 21, lines 8-10, in the application as filed.

Accordingly, upon entry of this amendment, claims 31-38 and 47- 84 are pending, subject to reinstatement of the claims of Group IV, claims 39-46.

## **II. REJECTIONS UNDER 35 U.S.C. § 102(b):**

Claims 31-38 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,355,791 to Gjerde (hereinafter "Gjerde"). The Examiner stated on page 5 of the Office Action that Gjerde

discloses a method to separate a mixture of double stranded polynucleotides fragments having up to 1500 base pairs, the method comprising (a) applying the mixture to a polymeric separation medium having nonpolar surfaces, wherein the surfaces are characterized by being substantially free from multivalent cations which are free to bind with DNA, wherein the surfaces are the surfaces of the interstitial spaces of a polymer monolith and (b) separating the mixture of polynucleotides, wherein the polymeric monolith includes poly(styrene-divinylbenzene) which is brominated to [re]move the remaining double bonds on the surface thereof (citing Example 7, claims 1 and 9). [Emphasis in original].

Applicant respectfully traverses this rejection. Gjerde does not anticipate the pending claims, *inter alia*, because it does not teach each and every feature of the pending claims. Specifically, Gjerde does not teach use of a chromatography sorbent "comprising polymer beads

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of aromatic vinyl monomers substituted with hydrocarbyl or halocarbyl substituents, or combinations thereof, comprising from 1 to 1,000,000 carbon atoms, *wherein said aromatic vinyl monomers or said hydrocarbyl substituents or both have been functionalized by halogenation.*" In Applicant's specification, functionalization by halogenation is described, and in one aspect, includes bromination by electrophilic aromatic substitution on the aromatic monomers, *not of the unreacted vinyl groups as taught by Gjerde*. To the contrary, Gjerde teaches a completely different halogenation step, that is, bromination to remove double bonds remaining on the polymer after polymerization. The bromination described by Gjerde is different in that it does not produce the desired functionalization described in the present specification, that is, bromination of the aromatic vinyl monomers via electrophilic aromatic substitution. Instead, the method described by Gjerde can only brominate the few unreacted vinyl monomers remaining after polymerization. Example 2 of the instant specification is illustrative of this difference: PSDVB-C<sub>18</sub> particles purchased from the assignee of Gjerde were brominated by electrophilic aromatic substitution. Bromine content was increased from less than 0.06% by weight in untreated samples to greater than 9% by weight in brominated PSDVB-C<sub>18</sub> particles as determined by elemental analysis. The greatly increased amount of bromine reflects additional bromination relative to the amount that could be introduced in the process of removing residual double bonds, and indicates that the procedure described in the instant specification is different from that described by Gjerde. Therefore Gjerde does not disclose or suggest the brominated PSDVB claimed and described in the instant specification, despite the superficial similarities.

Further, Gjerde does not disclose or suggest that the aromatic vinyl monomers, the hydrocarbyl substituents, or both, are functionalized by halogenation. In addition, Gjerde does not inherently describe the functionalization by halogenation, and in fact Gjerde could not inherently describe the herein described functionalization by halogenation because the bromination procedure described by Gjerde cannot brominate the aromatic portion of the aromatic vinyl monomers and provide the improved functional characteristics discovered by Applicant. Example 4 presents a comparison of the functional characteristics of PSDVB-C<sub>18</sub> particles brominated as described in Example 2 of the instant specification versus particles not treated by this bromination procedure. As shown in Fig. 10, the retention characteristics are greatly improved for labeled oligonucleotides relative to unlabeled oligonucleotides, and in comparison to untreated PSDVB-C<sub>18</sub> particles, the selectivity ratio  $\alpha$  is greatly enhanced. In other words, the claimed method of separating a mixture of analytes utilizing the chromatography sorbent described in the instant specification is greatly improved because the sorbent has been functionalized by halogenation, a result not disclosed in Gjerde.

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Therefore, for at least the above stated reasons, Applicant respectfully submits that claims 31-38 are patentable over Gjerde, and request that the rejections under 35 U.S.C. § 102(b) be withdrawn. Applicant respectfully submits that withdrawn claims 1-30, 39-46 and new claims 47-84 are also patentable over Gjerde.

Therefore, Applicant respectfully submits that the rejections have been overcome and that pending claims 31-38 and new claims 47- 84 are patentable. Withdrawal of the rejections of the claims over Gjerde is respectfully requested.

### **CONCLUSION**


Applicant respectfully submits that this application is in condition for allowance. Applicant respectfully requests entry of this amendment, reinstatement of claims 39-46, and examination of new claims 47-84. No new matter has been added. New claims 47-84 are fully supported in the specification and claims as filed. An early and favorable action on the merits is earnestly solicited.

Favorable consideration is respectfully requested in view of the Amendments and Remarks.

If the Examiner has any questions concerning this communication, or would like to discuss the application, the art, or other pertinent matters, he is welcome to contact the undersigned attorney at (650) 565-8185.

Respectfully submitted,

Date: January 7, 2006 By: \_\_\_\_\_

  
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